SURGICAL TREATMENT FOR DYSPHAGIA LUSORIA

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DYSPHAGIA LUSORIA has long been recognized as impairment of swallowing which occurs when a right subclavian artery arises abnormally from the left side of the aortic arch and then passes behind or in front of the esophagus and thereby compresses the esophageal tube. As early as 1794, Bayford[1] nicely described such an anatomic malformation and the clinical picture which it produced. An anomalous subclavian artery can exist without making itself manifest; it may be incidentally discovered at a postmortem examination. In other individuals it produces symptoms which are mild, and of little consequence. In occasional patients the disturbance in swallowing may be severe enough to interfere seriously with the individual's health or nutrition. Dysphagia is most apt to appear or to be aggravated (1) when the artery is taut and stretches across the esophagus like a bow-string; (2) when the vessel becomes sclerotic and less elastic in the latter part of life; or (3) when there is aneurysmal dilatation of the artery. The detection of the anomaly by roentgenological studies has been recently discussed by Copleman.[2] So far as I am aware, the following case is the first in which surgical division of such an anomalous vessel has been attempted.

Case Report.—J. R., a four-month-old baby, was referred to the hospital, November 14, 1945, by Dr. Joseph F. Gibbons, because of difficulty in feeding. At about four weeks of age it was first noticed that the child had discomfort or pain while nursing. During the act of deglutition, a little of the milk would be swallowed without hesitation, but the baby would then become fretful or would cry; following this he would either refuse to take more of the feeding, or would take it only under protest. Sometimes, six or eight ounces of the mixture would be ingested without much trouble, but on most occasions there was obviously something wrong after an ounce or two had been swallowed, and the child would "stiffen up with pain." There was occasional regurgitation of uncurdled milk, but there was no projectile vomiting. Several changes of formula were made without apparent benefit. At about four months of age, cereal was offered; this was taken eagerly in small amounts, but after it the baby would always refuse milk for several hours. In spite of these difficulties the weight-gain had been satisfactory, yet it was obvious that this state of affairs had depended upon an intelligent and attentive mother who had discovered that an adequate amount of milk mixture could be given to the baby by offering 15 to 20 small feedings through the day.

Physical Examination: The child appeared to be healthy. He weighed 16 pounds, 2 ounces. There were no important variations from the normal in the abdomen or chest. The baby was alert, and there was no reason to suspect central nervous system disease or birth injury.

Course: Roentgenologic examination in the lateral projection, after ingestion of a thin barium mixture, showed an indentation of the posterior wall of the esophagus at the level of the third thoracic vertebra. When viewed anteroposteriorly, this filling de-

fect lay in an oblique direction, and suggested that there was an elongated, narrow structure which ran upward and to the right between the vertebral column and the esophagus. Some of the films showed air in the entire trachea; this was not displaced, distorted, or compressed in any way. The roentgenologic findings were interpreted by Dr. Edward Neuhauser as representing an anomalous right subclavian artery, which arose from the left side of the aortic arch and then ran upward and to the right behind the esophagus so that this tube was compressed along its posterior wall.

The child was observed on the ward for 12 days. On some occasions the baby would take an entire feeding of six or eight ounces in a reasonably satisfactory manner.

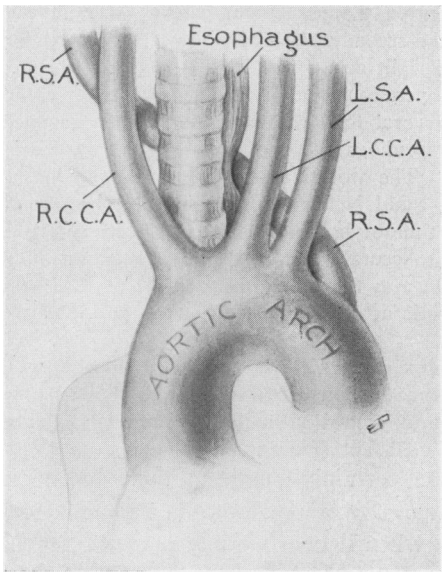

FIG. 1.—Drawing of anatomic arrangement found at operation. The anomalous right subclavian artery compresses the posterior wall of the esophagus. L. C. C. A.—Left common carotid artery. L. S. A.—Left subclavian artery. R. C. C. A.—Right common carotid artery. R. S. A.—Right subclavian artery.

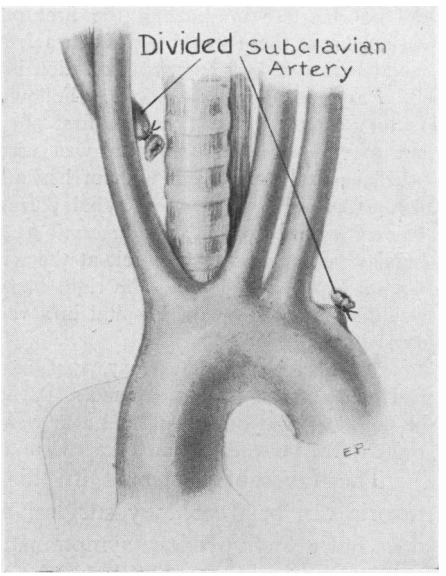

FIG. 2.—Surgical procedure. Esophageal compression has been relieved by dividing the right subclavian artery.

At other times, he would swallow only an ounce or two, would cry, and then refuse to take more. Through the first week, there was a weight loss of 14 ounces, but during the second week the child was urged much more during feedings and the weight rose again to the admission figure. From the history and hospital course it was obvious that the child's life was not endangered by the esophageal obstruction, and, indeed, the baby could be kept in a satisfactory state of nutrition with the existing intrathoracic abnormality. However, it was also clear that the difficulties in feeding were considerable, and it was reasonable to believe that the symptoms could be alleviated if the anomalous vessel were divided and the esophagus freed.

Operation.—November 26, 1945: Under cyclopropane anesthesia, with a tightly fitting face mask, and without an intratracheal catheter, anterolateral approach was made through the left side of the chest, entering the pleural cavity through the third interspace. The third and second costal cartilages were divided. This gave an excellent exposure of the mediastinum. The aortic arch lay in a normal position. The thymus

was partially dissected away and exposure was gained toward the patient's right so that the entire arch and its various branches could be adequately viewed (Fig. 1). The right subclavian artery arose in an anomalous fashion from the posterior aspect of the left side of the aortic arch and then coursed upward and to the right behind the esophagus, the posterior wall of which was indented. Between this anomalous artery and the vertebral column the thoracic duct was clearly visible and could be left undisturbed during the subsequent dissection. The right subclavian artery was extensively liberated from its bed and was then doubly ligated and divided near the aortic arch. The distal portion of the artery was permitted to retract to the patient's right and beyond the esophagus (Fig. 2). The lung was completely reëxpanded and the chest appropriately closed. I did not hesitate in dividing the first portion of the subclavian artery, since it was assumed that there would be branches from the second and third parts of the vessel for maintenance of an adequate circulation in the right arm.

Postoperative Observations: Following operation the baby had an extremely satisfactory convalescence. For the first 36 hours oral fluid was given in limited amounts, but after this a full formula was used. Feedings were offered on a four-hourly schedule, and were taken without hesitation. The wound healed *per primam*. At the completion of operation no radial pulsation could be detected, but a faint beat could be felt in the right axillary artery. At the time of hospital discharge, frequent but irregular pulsations could be felt at the wrist. Accurate skin temperature readings were not made, but at all times the right hand and arm felt as warm as the left. The baby was discharged from the hospital in a very satisfactory state on the tenth postoperative day.

When last seen, January 7, 1946, the baby had had no trouble in swallowing, and had gained to 18 pounds, 6 ounces. Barium examination of the esophagus showed it to be normal. The right hand and arm were warm, moved normally, and were pink. The right radial pulse could not be accurately counted, but frequent beats could be felt.

The favorable outcome in this case certainly suggests that dysphagia lusoria can be treated by surgical means. An anomalous subclavian artery does not always produce symptoms, but when it does so, any pressure on the esophagus can be abolished by the procedure which is here described. The intrathoracic part of the subclavian artery can be divided with impunity because the second and third portions of the vessel have collateral channels which are sufficient to maintain a satisfactory flow of blood to the arm.

REFERENCES

[1] Bayford, D.: An Account of a Singular Case of Deglutition. Mem. Med. Soc., London, **2**, 271, 1794.

[2] Copleman, B.: Anomalous Right Subclavian Artery. Am. J. Roentgen., **54**, 270, 1945.